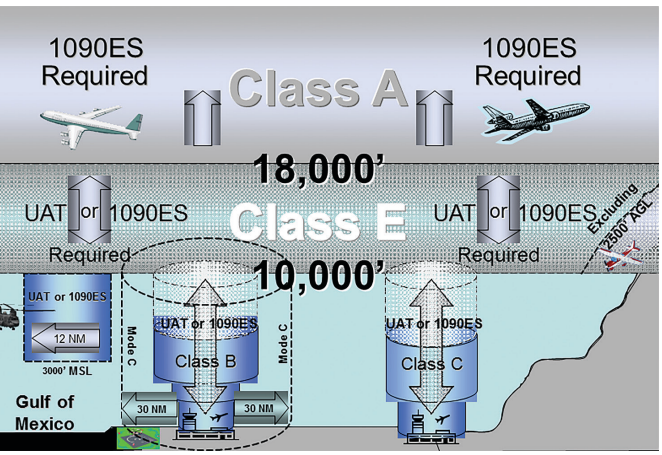
Got ADS-B?

BY DAVID HUGHES, NEXTGEN PERFORMANCE AND OUTREACH, FEDERAL AVIATION ADMINISTRATION

Repair shop operators in the U.S. say the time is now for customers to schedule an Automatic Dependent Surveillance–Broadcast (ADS-B) installation because waiting risks not being able to get an installation done by the 2020 deadline.

The Federal Aviation Administration also is trying to educate aircraft owners with a new website designed to answer any question they might have about an ADS-B installation, including how to equip a particular aircraft and what equipment has been FAA certified. This new website at www.faa.gov/go/equipadsb is up to date with the latest information.

Most repair shops can only work on a few aircraft at a time, so aircraft owners should not put an ADS-B installation off for too long, according to Chuck Gallagher, manager of Cincinnati Avionics at the Clermont County Airport in Batavia, Ohio.



The FAA offers an online resource devoted to educating the pilot community on the ADS-B mandate at www.faa.gov/go/equipadsb.

Be an early bird

It is still possible to be an early bird in the migration of as many as 200,000 general aviation aircraft owners who will install ADS-B avionics by the 2020 deadline.

"My best customers are really on the ball, and they have already equipped to beat the rush," Gallagher said.

Many other general aviation aircraft owners Gallagher talks to are starting to turn into the wind, as well.

"I think people believe it's a hard deadline and they are starting to get serious," he said. "But you will always have some who will wait and won't be able to fly in most controlled airspace on Jan. 1, 2020."

Gallagher said it is possible for the owner of

THIS STORY WAS ORIGINALLY PUBLISHED IN THE 2015-16 EDITION OF THE AIRCRAFT ELECTRONICS ASSOCIATION'S PILOT'S GUIDE TO AVIONICS, PUBLISHED IN JULY 2015.

Adam Ralstin of Cincinnati Avionics/ Sporty's Pilot Shop, performs wiring continuity checks during the installation of a Garmin GDL 88 ADS-B universal access transceiver.

a Cessna 172 valued at $25,000 to equip with ADS-B for under $5,000, including installation. That makes the purchase affordable for most people, so it appears to be the "magic number," he added.

FAA forms Equip 2020 team

The FAA's new website is part of a larger effort the agency has taken in the past five months to help jump-start ADS-B installations.

The FAA played host to a "Call to Action" summit at its Washington, D.C., headquarters in October 2014 with the aviation industry and other interested parties. General aviation industry officials voiced concerns at the meeting about the ADS-B mandate, with the cost of equipage ranking chief among them.

To address this and other issues that might pose obstacles to equipping general aviation aircraft with ADS-B, an ad hoc team named Equip 2020 was formed by the FAA and the NextGen Institute. The institute is a partnership between the U.S. government and the private sector to work together on long-term NextGen plans and implementation.

The small team has been quickly resolving a range of challenging issues with aircraft operators and the aviation industry. Equip 2020 is led by Marke "Hoot" Gibson, executive director of the NextGen Institute.

Marke "Hoot" Gibson, executive director of the NextGen Institute

In addition, a private sector initiative named Jumpstart GA 2020 aims to accelerate the general aviation community's adoption of rule-compliant ADS-B Out avionics. As part of this program, the NextGen GA Fund has secured an order for 10,000 L-3 Lynx NGT-1000 units manufactured by L-3 Aviation Products. The equipment will be offered on a first-come, first-served basis on the condition that operators install the equipment by July 1, 2016.

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FreeFlight Systems also has a program, Equip-It 2020, to provide ADS-B Out equipment for light general aviation aircraft with a price tag just below $2,000. It offers an ADS-B In/Out system for about $3,700. Both systems come with built-in wide area augmentation system/GPS and include ADS-B and GPS antennas, an install kit, control head and/or Wi-Fi module if needed.

John DenDekker, general manager of Carpenter Avionics at Smyrna Airport in Smyrna, Tennessee, says there is confusion among operators on how to equip to meet the mandate.

The 2020 mandate won't change

Some members of the general aviation community have wondered if the FAA is going to stick to its 2020 mandate. FAA Administrator Michael Huerta has consistently said that the date for the mandate won't change. In May 2015 during a speech given at the Wichita Aero Club, Huerta said, "Many of you have asked about that deadline, and if it might be extended. The answer is no – the date is set – so I want to strongly encourage you to make plans to get equipped as soon as possible. You don't want to end up grounded in the early months of 2020 because of a parts or installation delay."

As AirVenture 2015 begins, there will be only four-and-a-half years left to meet the mandate. That won't change because the entire world is standardizing on ADS-B.

The FAA completed baseline, nationwide deployment of 634 ADS-B ground stations in 2014, as part of the agency's commitment to complete NextGen's foundational infrastructure by 2015. The agency is encouraging general aviation aircraft owners who plan to equip with ADS-B Out to do so as soon as possible to avoid the rush of last-minute installations. And general aviation aircraft owners who also opt for ADS-B In will see an immediate benefit in improved situational awareness for traffic and weather.

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>
> MICHAEL HUERTA, FAA Administrator

Equip 2020 rapid progress

Equip 2020 has made major progress in addressing anything that might impede general aviation equipage with ADS-B.

"In the past five months, we solved most of the major issues that have been out there for years with little progress," Gibson said. "Many people did not think these issues could be resolved."

The FAA point man on Equip 2020 is Bruce DeCleene, manager of the Flight Technologies and Procedures division in the Flight Standards Service. The general aviation community has been well represented by Ric Peri, vice president of government and industry affairs with the

Dewey Conroy, vice president and chief operating officer for Pacific Coast Avionics in Aurora, Oregon, is offering pilot seminars on equipage requirements.

Aircraft Electronics Association; Jens Hennig, vice president of operations at the General Aviation Manufacturers Association; and Melissa Rudinger, senior vice president of government affairs with the Aircraft Owners and Pilots Association.

"Equip 2020 is helping educate pilots about the benefits of ADS-B Out, a prerequisite for many ADS-B In functions," DeCleene said. "This includes display of traffic and a new capability that actually provides traffic alerts. While ADS-B In can be integrated into portable equipment, ADS-B Out must be installed in the aircraft to provide reliable GPS reception and transmission of ADS-B Out messages."

The big decision

Hennig said every aircraft owner should start making a decision now on what to do about ADS-B installation because the decision can take a while to make and can follow several paths.

ADS-B Out uses GPS satellite technology to determine an aircraft's location, ground speed and other data, and broadcasts that information to other aircraft and to a network of ground stations. Aircraft with ADS-B In reception capability can receive positions from other aircraft directly if both aircraft are operating on the same frequency or by relay from the ground. The ADS-B ground stations also feed data on aircraft location to displays used by air traffic controllers.

Aircraft can be equipped with an ADS-B Out system and also have an ADS-B-In receiver on either 1090 megahertz or a universal access transceiver operating on 978 MHz. Or an aircraft can have equipment operating on both frequencies with a "dual-link" receiver. UAT-equipped aircraft also can receive graphical weather on ADS-B In as well as text-based advisories, including notices to airmen and significant weather activity for display in the cockpit.

"You can decide to comply with the rule and only install ADS-B Out, or you can do more such as installing ADS-B In," Hennig said. "It may take a while to figure out where you want to end up. You may spend $2,000 to $3,000 on ADS-B avionics plus the installation, or more depending on what you decide."

And the decision may vary by geographical region, Hennig noted. It could be different for an aircraft owner based on the East Coast or California than one who flies in the Dakotas. Someone who stays below 10,000 feet in airspace where ADS-B is not required may elect not to equip.

"It really depends on what equipment you have on your aircraft now and what you want to do," Hennig added.

The new FAA ADS-B website is designed to walk aircraft owners through issues to consider.

Gallagher noted that at his repair shop, an ADS-B installation can take anywhere from 12 to 20 hours. He said installation may require mounting a stand-alone GPS antenna on top of the fuselage and an ADS-B antenna on the bottom. If

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Equipage Monitoring (11,052 as of April 5, 2015)

Category	Feb. 2015 (as of March 1, 2015)	March 2015 (as of April 1, 2015)	Increase	
Link Ver 2	10,211	10,949	+738	7.2%
1090ES	7,143	7,692	+549	7.7%
UAT	2,728	2,913	+185	6.8%
Dual	340	344	+4	1.2%
U.S. General Aviation	8,811	9,443	+632	7.2%
U.S. Air Carrier	267	276	+9	3.4%
Intl. General Aviation	1,039*	1,110*	+71	6.8%
Intl. Air Carrier	94	96	+2	2.1%
U.S. Military Active & Reserved	24	24	0	0.0%

Data Source: www.compliancemonitor.faa.gov
***Aircraft incorrectly reporting outside U.S. ICAO block are included in Intl. GA count.**

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the avionics box is mounted in the tail, then the electronics wiring from the cockpit to the back end of the aircraft will have to be modified.

Hennig said he was worried in mid-2014 when only several hundred ADS-B installations per month were occurring in the U.S. While that has increased to 500 to 700 per month, it is still not the needed average pace of 1,000 to 2,000 per month. About 11,000 general aviation aircraft with U.S. registry had ADS-B equipment as of May 1, 2015. There are about 200,000 active general aviation aircraft, according to the FAA.

Competitive products have become much more widely available in the past six months, according to Hennig. If an aircraft owner is waiting for prices to drop, that is a mistake, he said.

"No one believes the bare bones price point will fall much farther," he added.

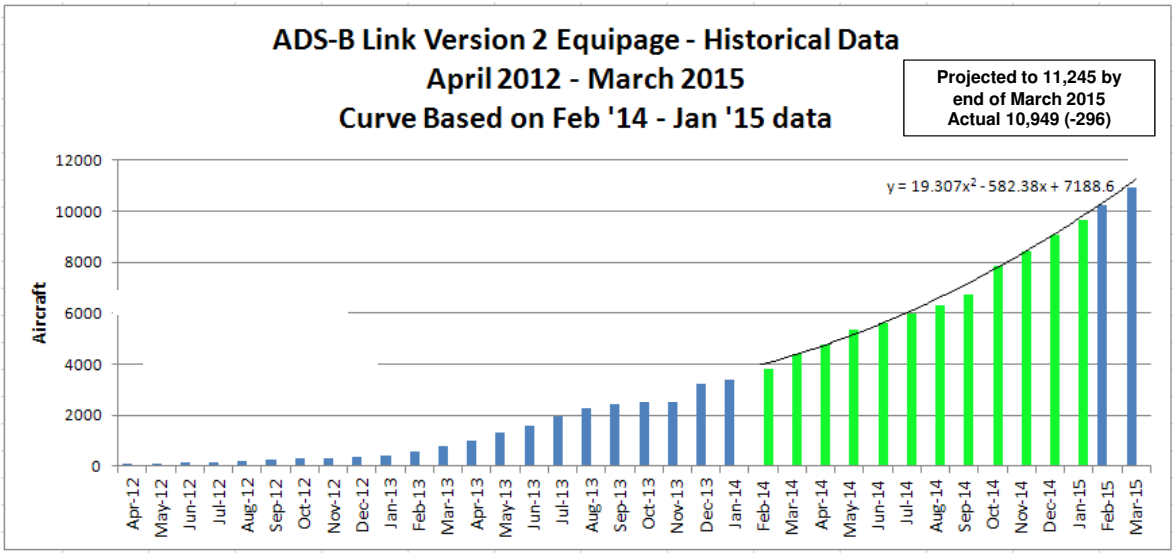
Countering confusion with education

Avionics manufacturers and repair shops also are engaged in educating their aircraft owner customers about what they need to do to meet the ADS-B Out mandate and what the benefits are of going beyond that with ADS-B In.

"There is a lot of confusion out there on what needs to be done and what can be done," said John DenDekker, general manager of Carpenter Avionics at Smyrna Airport in Smyrna, Tennessee. He services high performance single- and twin-engine aircraft, turboprops and light jets.

With all of the options available, there are many key technical considerations, such as matching the right transponder to the right position source. The new FAA ADS-B website has a list of the certified pairings.

DenDekker said only about half the aircraft owners that operate above flight level 180 with a transponder want to have ADS-B In as part of



Date	Projected Equipage (based on 12-month equation above)
Jan. 1, 2016	20,078
Jan. 1, 2017	36,721
Jan. 1, 2018	58,925
Jan. 1, 2019	86,689
Jan. 1, 2020	120,014

Projected to 12,072 by end of April 2015

the installation, while most of those flying below that level with UAT want ADS-B In included. Many of these lower altitude flyers are opting to use portable devices.

But DenDekker is still running across pilots and aircraft owners who are pushing back and hoping the FAA extends the 2020 deadline, which he knows isn't going to happen. His shop is doing about one installation a week, and he sees a crunch coming.

"They need to get on board," he said. "It is going to get busier and busier, and it will be more difficult to schedule an installation in a shop."

Another shop owner agrees with the need for aircraft owners to face facts.

"I am very concerned that some people are not getting the message they need to do an ADS-B installation now," said Dewey Conroy, vice president and chief operating officer for Pacific Coast Avionics at Aurora State Airport in Aurora, Oregon.

"They had better get on board," he said. In particular, he said anyone who flies a pressurized aircraft has no choice because they will need ADS-B Out to fly above 10,000 feet. (The mandate does not apply up to 2,500 feet above ground level where terrain is above 7,500 feet mean sea level.)

Education is the key, and Pacific Coast Avionics will work with a leading avionics manufacturer to conduct a series of seminars in Oregon during the summer months of 2015, two in Portland and one in the eastern part of the state. The presentation will be "low key and low tech," according to Conroy.

The seminars will be backed up by a dedicated ADS-B website Pacific Coast Avionics has launched at https://www.pacificcoastavionics.com/ads-b.aspx. The website is designed to help customers decide how to equip by looking at a flow chart. An interactive Google map feature will allow pilots to look at where they fly to see if they need ADS-B. The opening page features a countdown clock showing how long it is, down to the second, to the Jan. 1, 2020 deadline. ❑

FAA-approved V2 ADS-B Out avionics *(as of May 5, 2015)*

The FAA does not endorse any product or manufacturer listed. These pairings of ADS-B and position sources are listed in order of when the supplemental type certificate was issued. *Source: Federal Aviation Administration*

Manufacturer	ADS-B Model Number	Approved Position Source(s)
Exelis / FreeFlight Systems	FDL-978-TXG	
ACSS	XS-950	RCI GLU-920, GLU-925 RCI GLU-920 Thales TLS755 RCI GPS-4000S
Honeywell	XS-852	CMC CMA-4024-1 SBAS
Trig Avionics	TT-31	FreeFlight WAAS 1201 Accord Technology NexNav Mini Garmin GNS 400W/500W series Trig TN70
FreeFlight Systems	FDL-978-TX	FreeFlight WAAS 1201
Honeywell	ISP-80A.1	Honeywell ADIRU Part Numbers (P/N) HG2030BE02, BE03 or BE04
Trig Avionics	TT-22	FreeFlight WAAS 1201
Garmin	GDL 88 GTX 23 GTX 33x w/ES GTX 330x GTX 3000 (GTX models require appropriate S/W rev)	Garmin GTN 625/635/650, GTN 725/750, GPS 400W, GNC 420W/420AW, GNS 430W/430AW, GPS 500W/530W (w/ or w/o TAWS) (all require appropriate S/W rev)
Honeywell	MRC XPDR w/ADS-B Out	CMC CMA-3024 SBAS GNSSU MK II and CMA-4024 SBAS GNSSU
Honeywell	XS-858B P/N 7517402-970	Honeywell GPS module (made by CMC), P/N 245-604067-100
Honeywell	XS-858B P/N:7017401-970	CMC GNSS/MMR, P/N 245-604067-100 Honeywell GNSS/MMR VIDL-G, P/N: 7026208-804
FreeFlight Systems	FDL-1090-TX	FreeFlight WAAS 1201 (either external or integrated in FDL-978-XVR)
FreeFlight Systems	FDL-978-XVR	FreeFlight WAAS 1201 (either external or integrated in FDL-978-XVR)
Avidyne	AXP340	Garmin GNS 430/530 Avidyne IFD540
Rockwell Collins	TDR-94/94D-550/551	Universal UNS-1xw series (1Ew/1Espw/1Fw/1Lw)

Manufacturer	ADS-B Model Number	Approved Position Source(s)
BendixKing	KT-74	Accord Technology NexNav Mini FreeFlight WAAS 1201 GNS 400W/500W series
Honeywell	KXP 2290A	Honeywell KGS200
NavWorx	ADS600-B	Accord Technology NexNav Mini
Rockwell Collins	TSS-4100	RCI GPS-4000S
ACSS	NXT-600	Universal UNS-1xw series (1Ew/1Espw/1Fw/1Lw); Thales Topstar 200 LPV or NG
ACSS	T^{3}CAS 9005000	RCI GLU-920/925, Honeywell RMA-55B, Thales TLS755
ACSS	NXT-800	RCI GLU-925 RCI GLU-920/925 RCI GLU-925
Garmin	GTX-330ES	Garmin GNS-430W
L-3 Aviation Products	NGT-2000/2500 NGT-9000D	Integrated in NGT-xxxx (SBAS)
Rockwell Collins	TDR-94/94D-501	RCI GPS-4000S Universal UNS-1xw series
Aspen Avionics	ATX100G	FreeFlight WAAS 1201 (integrated in ATX100G)

FAA-sponsored projects that will result in V2 ADS-B Out avionics

Manufacturer	ADS-B Model Number	Planned Position Source(s)
FreeFlight Systems	FDL-978-XVR	FreeFlight WAAS1201 (either external or integrated in FDL-978-XVR)
Rockwell Collins	TPR 901-205	RCI GLU 925-001; RCI GLU 925-330
Honeywell	TPA-100B	B747-400
Honeywell	TPA-100B	A330/340; A318/319/320/321
ACSS	TCAS3000SP	A330/340; A318/319/320/321
ACSS	TCAS3000SP	B767-300; A330
Garmin	GDL 88	King Air C-90
NavWorx	ADS600-B	Piper PA-32RT
FreeFlight Systems	FDL-978-XVR	Bell 206 Fixed-Wing
L-3 Aviation Products	NGT-2000/2500; NGT-9000	Cirrus SR-22; Cirrus SR-22
Aspen Avionics	ATX100G	N/A
FreeFlight Systems	FDL-978-XVR	Rotorcraft models other than Bell 206